

Having thus described the preferred embodiments, the invention is now claimed to be:

1           1.     An abstraction layer for a database containing database records each  
2     including a plurality of fields stored in one or more tables, the fields being associated  
3     with the record by a key disposed in at least one key column of each of the one or more  
4     tables, the abstraction layer including:

5           a key column identifier that identifies the at least one key column; and  
6           one or more metadata tables containing metadata relating to the database, the one  
7     or more metadata tables including at least:

8           a controls table containing control records corresponding to fields  
9           of the database, the control record for each field including at least a  
10          control key associating the control record with the field and at least one  
11          metadatum corresponding to the field.

1           2.     The abstraction layer as set forth in claim 1, wherein the at least one  
2     metadatum of at least one control record includes a datatype index value indicative of a  
3     datatype of the corresponding field, and the one or more metadata tables further include:

4           a datatypes table associating a plurality of datatype indices with datatypes.

1           3.     The abstraction layer as set forth in claim 2, wherein the datatypes of the  
2     datatypes table are selected from a group including: a character datatype, a numeric  
3     datatype, a text data type, a date data type, a time datatype, and a timestamp datatype.

1           **4.**     The abstraction layer as set forth in claim **2**, wherein the one or more  
2 metadata tables further include:

3           an operators table associating a database operation with a database type index  
4 value and with a corresponding display operator.

1           **5.**     The abstraction layer as set forth in claim **4**, wherein the operators table  
2 further associates the database operation with a corresponding second display operator,  
3 and the operators table further includes:

4           a language field associating a different language with each of the corresponding  
5 display operator and the corresponding second display operator, whereby the database  
6 operation has associated therewith display operators in at least two different languages.

1           **6.**     The abstraction layer as set forth in claim **2**, wherein the datatype index  
2 value indicates that the corresponding field is numeric, and the at least one metadatum  
3 further includes:

4           a sub-datatype index value indicative of a type of numeric value of the  
5 corresponding field, the sub-datatype index value being selected from a group including  
6 at least integer and floating-point numeric value types.

1           **7.**     The abstraction layer as set forth in claim **1**, wherein the one or more  
2 tables includes at least two tables, and the control record for each field further includes a  
3 table name that in combination with the control key associates the control record with the  
4 field.

1           **8.**     The abstraction layer as set forth in claim 7, wherein the one or more  
2 metadata tables further include:

3           a category table associating each of the at least two tables with one or more table  
4 characteristics.

1           **9.**     The abstraction layer as set forth in claim 1, wherein the at least one  
2 metadatum of at least one control record includes a search flag indicative of an type of  
3 searching executable on the corresponding field.

1           **10.**    The abstraction layer as set forth in claim 9, wherein the search flag has a  
2 value indicating that the corresponding field is searchable by a text search, and the at  
3 least one metadatum further includes:

4           a text search field region identifier indicating a portion of the corresponding field  
5 that is searchable by the text search.

1           **11.**    The abstraction layer as set forth in claim 9, wherein the search flag has a  
2 value indicating that the corresponding field is searchable by an SQL query, and the at  
3 least one metadatum further includes:

4           at least one SQL query format indicator indicative of an allowable SQL query  
5 format.

1           **12.**    The abstraction layer as set forth in claim 9, wherein the at least one  
2 metadatum further includes:

3           a case-sensitivity indicator that indicates whether searching on the corresponding  
4   field is case-sensitive.

1           **13.**    The abstraction layer as set forth in claim 1, wherein the at least one  
2   metadatum of at least one control record includes a sort flag identifying whether sorting  
3   can be done on the corresponding field.

1           **14.**    The abstraction layer as set forth in claim 1, wherein the at least one  
2   metadatum of at least one control record includes a display flag identifying whether the  
3   corresponding field is displayable.

1           **15.**    The abstraction layer as set forth in claim 1, wherein the one or more  
2   metadata tables further includes:  
3           a displayable table associating a plurality of display names with a field of the  
4   database through the control key of the controls table, the plurality of display names each  
5   corresponding to a different language whereby the display name is multilingual.

1           **16.**    The abstraction layer as set forth in claim 1, wherein the one or more  
2   metadata tables further includes:  
3           a syntax table associating syntactically valid inputs with a field of the database  
4   through the control key of the control record corresponding to the field.

1           **17.**    The abstraction layer as set forth in claim 16, wherein the at least one  
2   metadatum further includes:

3           a picklist flag indicating whether the entries of the syntax table are displayable as  
4   selections of an input of a GUI dialog box.

1           **18.**    The abstraction layer as set forth in claim 1, wherein the one or more  
2   metadata tables further includes:

3           an aliases table associating alias names with fields of the database through the  
4   control key of the control record corresponding to the field.

1           **19.**    The abstraction layer as set forth in claim 18, wherein the aliases table  
2   associates a plurality of alias names with at least one field of the database, each of the  
3   plurality of alias names having a language parameter associated therewith.

1           **20.**    The abstraction layer as set forth in claim 1, wherein the one or more  
2   metadata tables further includes:

3           a patterns table associating one or more search patterns with a field of the  
4   database through the control key of the control record corresponding to the field.

1           **21.**    A method for accessing a database containing database records each  
2   including a plurality of fields stored in one or more tables, the method including:

3           formulating a database access command using metadata related to the database  
4   contained in an abstraction layer, the metadata for each database field being accessible  
5   using an abstraction layer control record associated with the database field; and

6           executing the formulated database access command to access the database.

1           **22.**     The method as set forth in claim **21**, wherein the abstraction layer includes  
2     at least one translation table that includes equivalent text in a plurality of languages  
3     associated with at least one database field, the formulating of the database access  
4     command including:

5           accessing the abstraction layer using a key that includes at least a field identifier  
6     and a language selection to retrieve the equivalent text in the selected language.

1           **23.**     The method as set forth in claim **22**, wherein the key further includes:  
2           a database access operator, the equivalent text being a displayable name for the  
3     database access operator.

1           **24.**     The method as set forth in claim **21**, wherein the abstraction layer  
2     includes:

3           a controls table containing the control records of the database fields, each control  
4     record including a field key; and

5           at least one metadata table containing records corresponding to database fields  
6     and linked to the control record by the field key.

1           **25.**     The method as set forth in claim **21**, wherein the abstraction layer  
2     includes:

3           a controls table containing the control records of the database fields, each control  
4     record including at least one index metadatum; and

5 at least one additional metadata table containing indexed metadata associable with  
6 database fields by the at least one index metadatum of the control records.

1 **26.** The method as set forth in claim **21**, further including:  
2 executing a user application program, the formulating of a database access  
3 command being performed as an operation of the executing user application program.

1 **27.** An article of manufacture comprising one or more program storage media  
2 readable by a computer and embodying at least an abstraction layer for facilitating  
3 accessing a database containing database records each including a plurality of fields  
4 stored in one or more tables, the abstraction layer including:

5 a control table containing control records corresponding to database fields, each  
6 control record containing metadata associated with the corresponding database field, and  
7 at least one additional table containing additional metadata, each database field  
8 being selectively associated with one or more selected portions of the additional metadata  
9 through metadata contained in the control record corresponding to the database field.

1 **28.** The article of manufacture as set forth in claim **27**, wherein the article of  
2 manufacture further embodies one or more instructions executable by the computer to  
3 perform a method for accessing the database, the method including:

4 formulating a database access command; and  
5 during the formulating, accessing an abstraction layer to identify at least one  
6 constraint on the database access command.

1           **29.**     The article of manufacture as set forth in claim **28**, wherein the identified  
2     constraint on the database access command is selected from a group consisting of: a text  
3     string in a selected language that is incorporated into the database access command, a  
4     datatype constraint, a search pattern, a search constraint, a sorting constraint, and a  
5     display constraint.

1           **30.**     The article of manufacture as set forth in claim **28**, wherein the article of  
2     manufacture further embodies a user application program executable by the computer, the  
3     executing user application program being operatively linked with the method for  
4     accessing the database.  
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